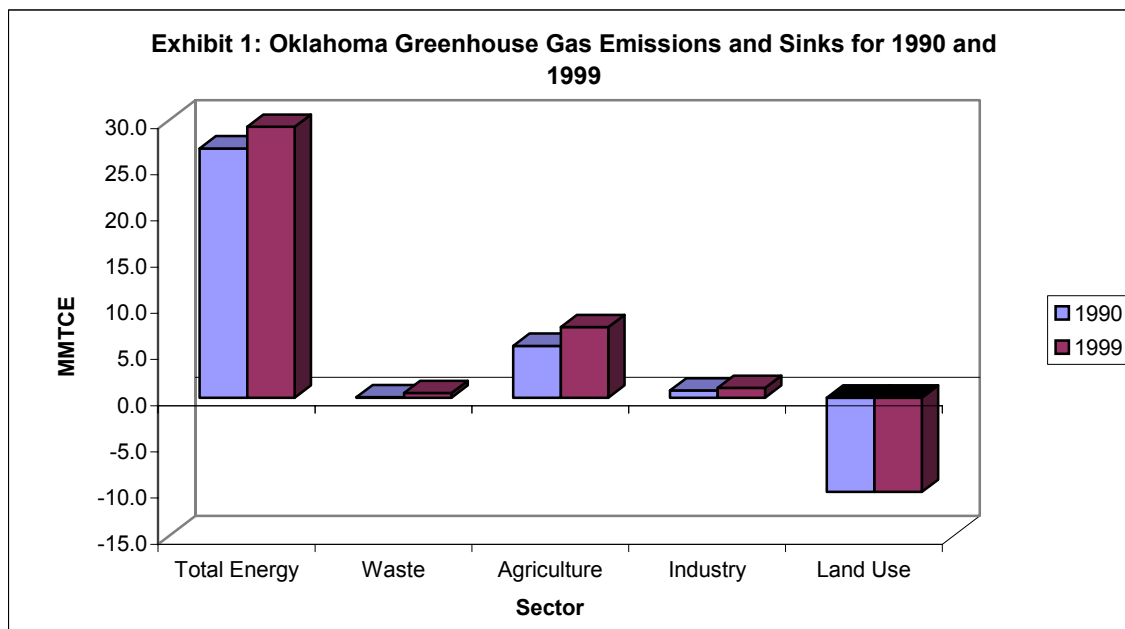


OKLAHOMA GREENHOUSE GAS EMISSIONS AND SINKS INVENTORY: SUMMARY



The report “*Inventory of Oklahoma Greenhouse Gas Emissions and Sinks: 1990 and 1999*” provides a detailed inventory of greenhouse gas emissions and sinks for Oklahoma for the years 1990 and 1999. To ensure comparability with other states’ inventory summaries, this report presents Oklahoma’s 1990 emissions, as well as the more recent 1999 emissions. Emissions were estimated using methods from the EPA’s 1999 guidance document ***EIIP Document Series, Volume VIII: Estimating Greenhouse Gas Emissions***.¹ In 1990, Oklahoma had net emissions of 23.2 million metric tons of carbon equivalent (MMTCE). Net emissions increased to 28.3 MMTCE in 1999. Carbon dioxide sinks offset approximately 43 percent of total carbon dioxide emissions in 1990, and declined to about 39 percent in 1999.²

The principal greenhouse gas was carbon dioxide, comprising a net 50.2 million metric tons (13.7 MMTCE) in 1990 and 60.5 million metric tons (16.5 MMTCE) in 1999. Other emissions included methane with 1.1 million metric tons (6.4 MMTCE) in 1990 and 1.4 million metric tons (8.2 MMTCE) in 1999, and nitrous oxide with 0.04 metric tons (3.0 MMTCE) in 1990 and 0.04 million metric tons (3.4 MMTCE) in 1999. Additionally, emissions included 20.6 metric tons of SF₆ (0.13 MMTCE) and 0.003 MMTCE of hydrofluorocarbons (HFCs) and perfluorocarbons (PFCs) in 1990 and 9.9 metric tons of SF₆ (0.06 MMTCE) and 0.17 MMTCE of HFCs and PFCs in 1999.³

¹ Note that state-of-the-art emission inventory methodology has advanced since the EPA published the EIIP guidance in 1999. The numbers reported here are taken directly from the Oklahoma inventory report and have not been adjusted to reflect the latest methodology. Therefore the categories, methods, and emission factors used to calculate these estimates may not be comparable to those used in other state inventory summaries.

² These sinks include carbon sequestration from land use change and forestry and landfills. While many states do not account for carbon stored in landfills, it is summarized here as it is a sink detailed in the EIIP Guidelines and reported by Oklahoma.

³ Emissions from HFCs and PFCs are reported together in units of carbon equivalents as they are in the Oklahoma Inventory.

In 1990 the majority of carbon dioxide emissions were from fossil fuel combustion (99%), with the remainder due to industrial uses (1%) and agricultural soil management (<1%). The main contributors to methane emissions were natural gas and oil systems (45%),⁴ enteric fermentation (25%), manure management (25%), and municipal waste disposal (4%). Nitrous oxide emissions were primarily attributable to agricultural soil management (78%), industrial processes (12%), mobile combustion (6%), manure management (2%), stationary combustion (1%), and municipal wastewater (1%). The major sources of high-GWP gas emissions were electric utilities (97%), substitution of ozone-depleting substances (2%), and magnesium production and processing (1%). (See *Exhibit 2*)

Exhibit 2: Oklahoma Greenhouse Gas Emissions and Sinks for 1990

BY SECTOR	Carbon Dioxide (MMTCE)	Methane (MMTCE)	Nitrous Oxide (MMTCE)	HFCs, PFCs, and SF6 (MMTCE)	Total GHG Emissions (MMTCE)
Energy - Residential	1.1	0.0	0.0	*	1.1
Energy - Commercial	0.7	0.0	0.0	*	0.7
Energy - Industrial	6.2	0.0	0.0	*	6.2
Energy - Transport	6.5	0.0	0.2	*	6.7
Energy - Utility	9.4	0.0	0.0	*	9.4
Energy - Exported Electricity	*	*	*	*	*
Energy - Other	*	2.9	*	*	2.9
Total Energy	23.8	2.9	0.2	*	27.0
Waste	-0.2	0.3	0.0	*	0.1
Agriculture	0.0	3.2	2.4	*	5.6
Industry	0.3	*	0.3	0.1	0.8
Land Use	-10.2	*	*	*	-10.2
Total	13.7	6.4	3.0	0.1	23.2

An asterisk (*) indicates that emissions of the gas from this sector were zero, insignificant, or not reported.

Emissions due to coal mining and extraction of natural gas and oil are included in the "Energy – Other" figures, and emissions from biofuel combustion are excluded.

In 1999, the majority of carbon dioxide emissions were still from fossil fuel combustion (98%), with the remainder due to industrial uses (1%) and agricultural soil management (<1%). Major sources of methane emissions included manure management (40%), natural gas and oil systems (29%),⁵ enteric fermentation (20%), and municipal waste disposal (9%). Nitrous oxide emissions were mostly attributable to agricultural soil management (75%), industrial processes (13%), mobile combustion (8%), manure management (2%), and stationary combustion (2%). The major sources of high-GWP gas emissions were substitution of ozone-depleting substances (73%) and electric utilities (27%). (See *Exhibit 3*)

^{4, 5} Oklahoma developed low, high, and median emission estimates from oil systems. The values reported in this summary are the "conservative" high estimates, which are the values reported in the Executive Summary and emissions totals in the Oklahoma Inventory.

Exhibit 3: Oklahoma Greenhouse Gas Emissions and Sinks for 1999

BY SECTOR	Carbon Dioxide (MMTCE)	Methane (MMTCE)	Nitrous Oxide (MMTCE)	HFCs, PFCs, and SF6 (MMTCE)	Total GHG Emissions (MMTCE)
Energy - Residential	1.1	0.0	0.0	*	1.1
Energy - Commercial	0.6	0.0	0.0	*	0.6
Energy - Industrial	5.5	0.0	0.0	*	5.5
Energy - Transport	7.7	0.0	0.3	*	8.0
Energy - Utility	11.7	0.0	0.0	*	11.8
Energy - Exported Electricity	*	*	*	*	*
Energy - Other	*	2.4	*	*	2.4
Total Energy	26.6	2.5	0.3	*	29.3
Waste	-0.3	0.8	0.0	*	0.5
Agriculture	0.0	5.0	2.6	*	7.6
Industry	0.4	*	0.4	0.2	1.1
Land Use	-10.2	*	*	*	-10.2
Total	16.5	8.2	3.4	0.2	28.3

An asterisk (*) indicates that emissions of the gas from this sector were zero, insignificant, or not reported.

Emissions due to coal mining and extraction of natural gas and oil are included in the “Energy – Other” figures, and emissions from biofuel combustion are excluded.

Oklahoma’s emissions in 1990 were 7.5 metric tons of carbon equivalent (MTCE) per capita, compared to 1990 U.S. emissions of 5.5 MTCE per capita. In 1999, Oklahoma’s per capita emissions increased to 8.5 MTCE, while the U.S. per capita rate rose to 5.9 MTCE.